



RECEIVED
JAN 14 2002
TECH CENTER 1600/2900

His Gln Val Phe Leu Asp Met Ala Val Leu Val Glu Ser Gln Gly Ala
225 230 235 240

Gln Leu Asp Asp Ile Glu Ser Gln Val Asn Arg Ala Asn Ser Phe Val
245 250 255

Arg Gly Gly Ala Gln Gln Leu Gln Val Ala Arg Lys His Gln Lys Asn
260 265 270

Thr Arg Lys Trp Thr Cys Phe Ala Ile Ile Leu Leu Leu Ile Ile Ile
275 280 285

Leu Val Val Val Leu Ser Ile Gln Pro Trp Lys Lys
290 295 300

<210> 3
<211> 1334
<212> DNA
<213> Arabidopsis thaliana

<220>
<221> CDS
<222> (77)..(991)

<400> 3
gaattcctcg agctacgtca gggattcatt ccgatctgaa atctctctct agatttctct 60

atttttcgaa ttttaa atg aac gat ttg ttt tcc agc tca ttc tct cgc ttc 112
Met Asn Asp Leu Phe Ser Ser Ser Phe Ser Arg Phe
1 5 10

cgc agc gga gaa cca tcc cct cgc cga gac gtt gcc gcc ggt gcc gac 160
Arg Ser Gly Glu Pro Ser Pro Arg Arg Asp Val Ala Gly Gly Gly Asp
15 20 25

gga gtt cag atg gcg aat ccc gcg gga tca acc ggt ggt gtg aac ctc 208
Gly Val Gln Met Ala Asn Pro Ala Gly Ser Thr Gly Gly Val Asn Leu
30 35 40

gac aag ttc ttc gaa gat gtt gaa tct gtg aaa gaa gag cta aag gag 256
Asp Lys Phe Phe Glu Asp Val Glu Ser Val Lys Glu Glu Leu Lys Glu
45 50 55 60

cta gat cgg ctc aac gaa aca ctc tct tca tgt cac gag cag agc aag 304
Leu Asp Arg Leu Asn Glu Thr Leu Ser Ser Cys His Glu Gln Ser Lys
65 70 75

acg ctt cac aat gct aaa gcc gtt aaa gat ctc cgg tct aaa atg gac 352
Thr Leu His Asn Ala Lys Ala Val Lys Asp Leu Arg Ser Lys Met Asp
80 85 90

ggt gac gtt gga gtc gcg ttg aag aag gcg aag atg att aaa gtt aaa 400
Gly Asp Val Gly Val Ala Leu Lys Lys Ala Lys Met Ile Lys Val Lys

95	100	105	
ctc gag gcg cta gat cgt gcc aat gct gct aat cgg agt ctc cct ggc Leu Glu Ala Leu Asp Arg Ala Asn Ala Ala Asn Arg Ser Leu Pro Gly 110 115 120			448
tgt gga cct ggt tct tcc tcc gat cga acc agg acc tct gtc ctc aat Cys Gly Pro Gly Ser Ser Ser Asp Arg Thr Arg Thr Ser Val Leu Asn 125 130 135 140			496
ggt ctc agg aag aaa ttg atg gac tct atg gat agt ttc aac cga ttg Gly Leu Arg Lys Lys Leu Met Asp Ser Met Asp Ser Phe Asn Arg Leu 145 150 155			544
agg gag ctt atc tcg tcc gag tat aga gaa act gta cag agg agg tac Arg Glu Leu Ile Ser Ser Glu Tyr Arg Glu Thr Val Gln Arg Arg Tyr 160 165 170			592
ttc acc gtc acc ggc gag aat ccg gat gaa cga acc cta gat cga ctg Phe Thr Val Thr Gly Glu Asn Pro Asp Glu Arg Thr Leu Asp Arg Leu 175 180 185			640
att tcc act gga gag agt gag aga ttc ttg cag aaa gca ata caa gaa Ile Ser Thr Gly Glu Ser Glu Arg Phe Leu Gln Lys Ala Ile Gln Glu 190 195 200			688
caa gga aga gga agg gtg tta gac acc att aac gag att caa gaa agg Gln Gly Arg Gly Arg Val Leu Asp Thr Ile Asn Glu Ile Gln Glu Arg 205 210 215 220			736
cat gat cgc gtt aaa gac att gag aag aat ctc agg gag ctt cac cag His Asp Arg Val Lys Asp Ile Glu Lys Asn Leu Arg Glu Leu His Gln 225 230 235			784
gtg ttt cta gac atg gcc gtg ctg gta gag cac cag gga gct cag ctt Val Phe Leu Asp Met Ala Val Leu Val Glu His Gln Gly Ala Gln Leu 240 245 250			832
gat gac atc gag agt cat gtg ggt cga gct agc tcc ttt atc aga ggc Asp Asp Ile Glu Ser His Val Gly Arg Ala Ser Ser Phe Ile Arg Gly 255 260 265			880
gga act gac cag cta caa acc gct cgg gtt tac cag aag aac acg cga Gly Thr Asp Gln Leu Gln Thr Ala Arg Val Tyr Gln Lys Asn Thr Arg 270 275 280			928
aaa tgg aca tgt att gcc att att att ctc atc atc atc ata act gtt Lys Trp Thr Cys Ile Ala Ile Ile Ile Leu Ile Ile Ile Ile Thr Val 285 290 295 300			976
gtg gtt ctt gct gtt ttaaaaccgt ggaacaacag cagtggcggc ggcggcgggtg Val Val Leu Ala Val 305			1031
gtggtggtgg gggtaccact ggaggaagtc aaccaaattc agggacacca ccaaattctc			1091
ctcaggcaag gcgtctattg cggtgaagtt gaagttgaag ttgagtttcg ttatttgcatt			1151
atatattctt tctttgaaaa accttattat caaaccagct ttgtgttact acttttctact			1211

gctgggttgt tgtaaacttc ccgtttatctt gggttttgtg aaagaattta aaatgtgggt 1271
tagatgagaa aattagtaca acattctctt gtatctatgt ttgctaccct gacgtagctc 1331
gag 1334

<210> 4
<211> 305
<212> PRT
<213> Arabidopsis thaliana

<400> 4

Met Asn Asp Leu Phe Ser Ser Ser Phe Ser Arg Phe Arg Ser Gly Glu
1 5 10 15

Pro Ser Pro Arg Arg Asp Val Ala Gly Gly Gly Asp Gly Val Gln Met
20 25 30

Ala Asn Pro Ala Gly Ser Thr Gly Gly Val Asn Leu Asp Lys Phe Phe
35 40 45

Glu Asp Val Glu Ser Val Lys Glu Glu Leu Lys Glu Leu Asp Arg Leu
50 55 60

Asn Glu Thr Leu Ser Ser Cys His Glu Gln Ser Lys Thr Leu His Asn
65 70 75 80

Ala Lys Ala Val Lys Asp Leu Arg Ser Lys Met Asp Gly Asp Val Gly
85 90 95

Val Ala Leu Lys Lys Ala Lys Met Ile Lys Val Lys Leu Glu Ala Leu
100 105 110

Asp Arg Ala Asn Ala Ala Asn Arg Ser Leu Pro Gly Cys Gly Pro Gly
115 120 125

Ser Ser Ser Asp Arg Thr Arg Thr Ser Val Leu Asn Gly Leu Arg Lys
130 135 140

Lys Leu Met Asp Ser Met Asp Ser Phe Asn Arg Leu Arg Glu Leu Ile
145 150 155 160

Ser Ser Glu Tyr Arg Glu Thr Val Gln Arg Arg Tyr Phe Thr Val Thr
165 170 175

Gly Glu Asn Pro Asp Glu Arg Thr Leu Asp Arg Leu Ile Ser Thr Gly
 180 185 190

Glu Ser Glu Arg Phe Leu Gln Lys Ala Ile Gln Glu Gln Gly Arg Gly
 195 200 205

Arg Val Leu Asp Thr Ile Asn Glu Ile Gln Glu Arg His Asp Arg Val
 210 215 220

Lys Asp Ile Glu Lys Asn Leu Arg Glu Leu His Gln Val Phe Leu Asp
 225 230 235 240

Met Ala Val Leu Val Glu His Gln Gly Ala Gln Leu Asp Asp Ile Glu
 245 250 255

Ser His Val Gly Arg Ala Ser Ser Phe Ile Arg Gly Gly Thr Asp Gln
 260 265 270

Leu Gln Thr Ala Arg Val Tyr Gln Lys Asn Thr Arg Lys Trp Thr Cys
 275 280 285

Ile Ala Ile Ile Ile Leu Ile Ile Ile Ile Thr Val Val Val Leu Ala
 290 295 300

Val
 305

<210> 5
 <211> 1205
 <212> DNA
 <213> Nicotiana tabacum

<400> 5
 ttttagattta ctcttatatt agtttgtttg tttaattgga cggttgttat atctttttct 60
 taatatgaga tttatgtcgt tattaatggt tttctcttga gggttcataa agagatttat 120
 cgtgtacctg ggggtaggtc aaatgagaag ggggtgaatt tttgtttttt ttttaggttt 180
 tattgtgttt tattattcgt accgatttta ttattttata tttttaaatc ttataagttt 240
 tgtaacttcc ccaggtggtc ttctggaaac tggatatctgt ttaagagtaa aaaaggtacc 300
 gacttatctt tcttggtggt ggttttacta ctattcgtct tcttattatc gttttgttca 360
 ggtaaaagat cacaagaaga ccacgaagga acggtgaacg tcaacgactc gtgggggaga 420
 ttgcttcctt aatcgggata agtgaaccga gagttatagt agttcaactc gaggaactga 480
 aagttggttt tgtcggtaca ggttcttatg aactacgtta agaaagtta aggagaggtt 540

```

aaggaagtgt cgaagtagcg aaagaactta aaggtattga cataggtagt gaacaggaga      600
gggaacgaga acttaacgga aaacgttctt gcagagtgaa actggacatc tataactcaca      660
tagttcttga cgaagtagtc ctaaaagagg acactgccat attatagcag caacttgaca      720
aagggatata agtctacggg agaaaacgga atcgagcaac ttgactaagt aactgagaac      780
ttcaaagaag gaattaggca agtggtgact tcaagagcag gacagtctac ttgaaggccc      840
aggtgtaggt ccctccgaag ctaagcgacg taaactagac agattccgaa gctctgcttg      900
aaactactta aaccgaaaga agttacggta cctttgcagt aataggtaca acctagaatc      960
tagaaattgc cgaaatcgca acacttctca gaacgaaaaa agtacccttc taacctcaac     1020
ccttatctaa aagagctccg gaaactcaag cagaaattac cgaagttgta gaagcttctt     1080
aaacagctct aactgaggcg gtcattacag agggtaaaga taccgcactc tcaggctaac     1140
tagcagtcga gactttgctc tctttctagg acttttatct agtaagtaaa actctaccct     1200
aaacc                                             1205

```

```

<210> 6
<211> 80
<212> PRT
<213> Nicotiana tabacum

```

```
<400> 6
```

```

Ser Asn Pro Glu Glu Lys Glu Phe Leu Asp Trp Ser Lys Arg Val Ile
1          5          10          15
Ile Ile Glu Gly Ile Gly Arg Gly Leu Leu Tyr Leu His Arg Asp Ser
20          25          30
Arg Leu Arg Ile Ile His Arg Asp Leu Lys Ala Ser Asn Ile Leu Leu
35          40          45
Asp Glu Gln Leu Asn Pro Lys Ile Ser Asp Phe Gly Met Ala Arg Ile
50          55          60
Phe Pro Gly Ser Gln Asp Gln Ala Asn Thr Glu Arg Val Val Gly Thr
65          70          75          80

```

```

<210> 7
<211> 77
<212> PRT
<213> Ipomoea trifida

```

```
<400> 7
```

```

Asn Lys Gln Arg Ser Ser Leu Leu Asn Trp Gln Thr Arg Phe Asn Ile
1          5          10          15
Ile Cys Gly Ile Ala Arg Gly Leu Leu Tyr Leu His Gln Asp Ser Arg

```

20 25 30
 Phe Arg Ile Ile His Arg Asp Leu Lys Ala Ser Asn Ile Leu Leu Asp
 35 40 45
 Lys Glu Met Asn Pro Lys Ile Ser Asp Phe Gly Met Ala Arg Ile Phe
 50 55 60
 Gly Gly Asp Glu Thr Asp Ala Asn Asn Thr Lys Arg Val
 65 70 75

<210> 8
 <211> 72
 <212> PRT
 <213> brassica campestris

<400> 8

Leu Asn Trp Lys Asp Arg Phe Ala Ile Thr Asn Gly Val Ala Arg Gly
 1 5 10 15
 Leu Leu Tyr Leu His Gln Asp Ser Arg Phe Arg Ile Ile His Arg Asp
 20 25 30
 Leu Lys Pro Gly Asn Ile Leu Leu Asp Lys Tyr Met Ile Pro Lys Ile
 35 40 45
 Ser Asp Phe Gly Met Ala Arg Ile Phe Ala Arg Asp Glu Ile Gln Ala
 50 55 60
 Arg Thr Asp Asn Ala Val Gly Thr
 65 70

<210> 9
 <211> 72
 <212> PRT
 <213> Brassica oleracea

<400> 9

Lys Lys Arg Ser Ser Asn Leu Asn Trp Lys Asp Arg Phe Ala Ile Ile
 1 5 10 15
 Asn Gly Val Ala Arg Gly Leu Leu Tyr Leu His Gln Asp Ser Arg Phe
 20 25 30
 Arg Ile Ile His Arg Asp Met Lys Pro Ser Asn Ile Leu Leu Asp Lys
 35 40 45
 Tyr Met Ile Pro Lys Ile Ser Asp Phe Gly Met Ala Arg Ile Phe Ala
 50 55 60
 Arg Asp Glu Thr Glu Ala Asn Thr
 65 70

<210> 10
 <211> 66
 <212> PRT
 <213> Nicotiana tabacum

<400> 10

Gly Leu Leu Cys Val Gln Glu Tyr Ala Glu Asp Arg Pro Asn Val Ser
 1 5 10 15

Val Val Leu Ser Met Leu Thr Ser Glu Ile Ser Asp Leu Pro Ser Pro
 20 25 30

Lys Gln Pro Ala Phe Thr Thr Arg Pro Ser Cys Ser Glu Lys Glu Ser
 35 40 45

Ser Lys Thr Gln Gly Ser Val Asn Thr Val Ser Ile Thr Ile Met Glu
 50 55 60

Gly Arg
 65

<210> 11

<211> 70

<212> PRT

<213> Ipomoea trifida

<400> 11

Gly Leu Leu Cys Val Gln Glu Gln Ala Glu Asp Arg Pro Asn Met Ala
 1 5 10 15

Thr Val Val Leu Met Leu Gly Ser Glu Ser Ala Thr Leu Pro Gln Pro
 20 25 30

Lys His Pro Gly Phe Cys Leu Gly Ser Arg Pro Ala Asp Met Asp Ser
 35 40 45

Ser Thr Ser Asn Cys Asp Glu Ser Cys Thr Val Asn Gln Val Thr Val
 50 55 60

Thr Met Leu Asp Gly Arg
 65 70

<210> 12

<211> 73

<212> PRT

<213> brassica campestris

<400> 12

Gly Leu Leu Cys Ile Gln Glu Arg Ala Glu His Arg Pro Thr Met Ser
 1 5 10 15

Ser Val Val Trp Met Leu Gly Ser Glu Ala Thr Glu Ile Pro Gln Pro
 20 25 30

Lys Pro Pro Val Tyr Cys Leu Ile Ala Ser Tyr Tyr Ala Asn Asn Pro
 35 40 45

Ser Ser Ser Arg Gln Phe Asp Asp Asp Glu Ser Trp Thr Val Asp Lys
 50 55 60

Tyr Thr Trp Ser Val Ile Asp Ala Arg
65 70

<210> 13
<211> 73
<212> PRT
<213> Brassica oleracea

<400> 13

Gly Leu Leu Cys Ile Gln Glu Arg Ala Glu Asp Arg Pro Thr Met Ser
1 5 10 15

Ser Val Val Trp Met Leu Gly Ser Glu Ala Thr Asp Ile Pro Gln Pro
20 25 30

Lys Pro Pro Ile Tyr Cys Leu Ile Thr Ser Tyr Tyr Ala Asn Asn Pro
35 40 45

Ser Ser Ser Arg Gln Phe Glu Asp Asp Glu Ser Trp Thr Val Asn Lys
50 55 60

Tyr Thr Cys Ser Val Ile Asp Ala Arg
65 70

<210> 14
<211> 124
<212> PRT
<213> Nicotiana tabacum

<400> 14

Arg Phe Arg Ala Val Thr Ser Ala Tyr Tyr Arg Ser Ala Val Gly Ala
1 5 10 15

Leu Leu Val Tyr Asp Ile Ser Arg Lys Thr Thr Phe Glu Asn Ile Gln
20 25 30

Cys Trp Leu Asp Glu Leu His Thr His Cys Asp Thr Thr Val Ala Arg
35 40 45

Met Leu Val Gly Asn Lys Cys Asp Leu Glu Asn Ile Arg Asp Val Ser
50 55 60

Ile Tyr Glu Gly Lys Asn Leu Ala Glu Glu Glu Gly Leu Phe Phe Ile
65 70 75 80

Glu Thr Ser Ala Leu Asp Ser Thr Asn Val Lys Gln Pro Leu Lys Leu
85 90 95

Ser Ser Ala Gln Ile Tyr Gln Asn Leu Ser Arg Lys Val Leu His Ser
100 105 110

Asp Ser Tyr Lys Thr Glu Leu Ser Val His Pro Val
115 120

<210> 15
<211> 124
<212> PRT

<213> Glycine max

<400> 15

```

Arg Phe Arg Ala Val Thr Ser Ala Tyr Tyr Arg Gly Ala Val Gly Ala
1           5           10           15
Leu Ile Val Tyr Asp Ile Ser Arg Arg Thr Thr Phe Asp Ser Val Gly
          20           25           30
Arg Trp Leu Asp Glu Leu Lys Thr His Cys Asp Thr Thr Val Ala Met
          35           40           45
Met Leu Val Gly Asn Lys Cys Asp Leu Glu Asn Ile Arg Ala Val Ser
          50           55           60
Ile Asp Glu Gly Lys Ser Leu Ala Glu Ala Glu Gly Leu Phe Phe Met
65           70           75           80
Glu Thr Ser Ala Leu Asp Ser Thr Asn Val Lys Met Ala Phe Glu Met
          85           90           95
Val Ile Arg Glu Ile Tyr Asn Asn Val Ser Arg Lys Val Leu Asn Ser
          100          105          110
Glu Thr Tyr Lys Ala Glu Leu Ser Val Asn Arg Val
          115          120

```

<210> 16

<211> 124

<212> PRT

<213> Lotus japonicus

<400> 16

```

Arg Phe Arg Ala Val Thr Ser Ala Tyr Tyr Arg Gly Ala Val Gly Ala
1           5           10           15
Leu Ile Val Tyr Asp Ile Thr Arg Arg Thr Thr Phe Asp Ser Val Ser
          20           25           30
Arg Trp Leu Asp Glu Leu Lys Thr His Cys Asp Thr Thr Val Ala Met
          35           40           45
Met Leu Val Gly Asn Lys Cys Asp Leu Glu Asn Ile Arg Ala Val Ser
          50           55           60
Ile Glu Glu Gly Lys Ser Leu Ala Glu Ala Gln Gly Leu Phe Phe Met
65           70           75           80
Glu Thr Ser Ala Leu Asp Ser Thr Asn Val Arg Thr Ala Phe Glu Met
          85           90           95
Val Ile Arg Glu Ile Tyr Asn Asn Val Ser Arg Lys Val Leu Asn Ser
          100          105          110
Asp Thr Tyr Lys Ala Glu Leu Ser Val Asp Arg Val
          115          120

```

<210> 17
 <211> 124
 <212> PRT
 <213> Arabidopsis thaliana

<400> 17

Arg Phe Arg Ala Val Thr Ser Ala Tyr Tyr Arg Gly Ala Val Gly Ala
 1 5 10 15

Leu Val Val Tyr Asp Ile Thr Arg Arg Thr Thr Phe Glu Ser Val Gly
 20 25 30

Arg Trp Leu Asp Glu Leu Lys Ile His Ser Asp Thr Thr Val Ala Arg
 35 40 45

Met Leu Val Gly Asn Lys Cys Asp Leu Glu Asn Ile Arg Ala Val Ser
 50 55 60

Val Glu Glu Gly Lys Ala Leu Ala Glu Glu Glu Gly Leu Phe Phe Val
 65 70 75 80

Glu Thr Ser Ala Leu Asp Ser Thr Asn Val Lys Thr Ala Phe Glu Met
 85 90 95

Val Ile Leu Asp Ile Tyr Asn Asn Val Ser Arg Lys Gln Leu Asn Ser
 100 105 110

Asp Thr Tyr Lys Asp Glu Leu Thr Val Asn Arg Val
 115 120

<210> 18
 <211> 124
 <212> PRT
 <213> Arabidopsis thaliana

<400> 18

Arg Phe Arg Ala Val Thr Ser Ala Tyr Tyr Arg Gly Ala Val Gly Ala
 1 5 10 15

Leu Val Val Tyr Asp Ile Thr Arg Ser Ser Thr Phe Glu Asn Val Gly
 20 25 30

Arg Trp Leu Asp Glu Leu Asn Thr His Ser Asp Thr Thr Val Ala Lys
 35 40 45

Met Leu Ile Gly Asn Lys Cys Asp Leu Glu Ser Ile Arg Ala Val Ser
 50 55 60

Val Glu Glu Gly Lys Ser Leu Ala Glu Ser Glu Gly Leu Phe Phe Met
 65 70 75 80

Glu Thr Ser Ala Leu Asp Ser Thr Asn Val Lys Thr Ala Phe Glu Met
 85 90 95

Val Ile Arg Glu Ile Tyr Ser Asn Ile Ser Arg Lys Gln Leu Asn Ser
 100 105 110

Asp Ser Tyr Lys Glu Glu Leu Thr Val Asn Arg Val
 115 120

<210> 19
 <211> 124
 <212> PRT
 <213> Nicotiana tabacum

<400> 19

Arg Phe Arg Ala Val Thr Ser Ala Tyr Tyr Arg Gly Ala Phe Gly Ala
 1 5 10 15

Leu Val Val Tyr Asp Ile Thr Arg Arg Thr Thr Phe Asp Ser Ile Pro
 20 25 30

Arg Trp Leu Asp Glu Leu Lys Thr His Ser Asp Thr Thr Val Ala Arg
 35 40 45

Met Leu Val Gly Asn Lys Cys Asp Leu Asp Asn Ile Arg Ala Val Ser
 50 55 60

Val Glu Glu Gly Lys Ser Leu Ala Glu Ser Glu Gly Met Phe Phe Met
 65 70 75 80

Glu Thr Ser Ala Leu Asp Ala Thr Asn Val Asn Lys Ala Phe Asp Met
 85 90 95

Val Ile Arg Glu Ile Tyr Asn Ser Val Ser Arg Lys Val Leu Asn Ser
 100 105 110

Asp Ser Tyr Lys Ala Glu Leu Ser Val Asn Arg Val
 115 120

<210> 20
 <211> 168
 <212> PRT
 <213> Nicotiana tabacum

<400> 20

Leu Ile Phe Ser Leu Glu Thr Phe Leu Leu Val Leu Leu Phe Phe Thr
 1 5 10 15

Leu Val Ser Ser Ser Ala Ser Glu Ile Phe Phe Glu Glu Ser Phe Asp
 20 25 30

Asp Gly Trp Arg Ser Arg Trp Val Lys Ser Asp Trp Lys Ile Ser Glu
 35 40 45

Gly Lys Ala Gly Ser Phe Lys His Thr Ala Gly Thr Trp Ala Gly Asp
 50 55 60

Pro Asp Asp Lys Gly Ile His Thr Thr Asn Asp Ala Lys His Phe Ala
 65 70 75 80

Val Ser Ala Lys Ile Pro Glu Phe Ser Asn Lys Asn Arg Thr Leu Val
 85 90 95

Val Gln Tyr Ser Ile Lys Phe Glu Pro Asp Ile Glu Cys Gly Arg Gly
 100 105 110
 Tyr Ile Lys Leu Leu Ser Gly Tyr Val His Pro Lys Lys Phe Gly Gly
 115 120 125
 Asp Thr Pro Tyr Ser Phe Met Phe Gly Ala Asp Ile Cys Gly Ser Gln
 130 135 140
 Thr Lys Lys Pro Ser Cys Leu Tyr Phe Pro Tyr Pro Gly Ala Glu Leu
 145 150 155 160
 Pro Pro Leu Pro Glu Arg Asn Leu
 165

<210> 21
 <211> 165
 <212> PRT
 <213> Arabidopsis thaliana

<400> 21

Asn Lys Leu Ser Phe Phe Cys Phe Phe Phe Leu Val Ser Val Leu Thr
 1 5 10 15
 Leu Ala Pro Leu Ala Phe Ser Glu Ile Phe Leu Glu Glu His Phe Glu
 20 25 30
 Gly Gly Trp Lys Ser Arg Trp Val Leu Ser Asp Trp Lys Arg Asn Glu
 35 40 45
 Gly Lys Ala Gly Thr Phe Lys His Thr Ala Gly Lys Trp Pro Gly Asp
 50 55 60
 Pro Asp Asn Lys Gly Ile Gln Thr Tyr Asn Asp Ala Lys His Tyr Ala
 65 70 75 80
 Ile Ser Ala Lys Ile Pro Glu Phe Ser Asn Lys Asn Arg Thr Leu Val
 85 90 95
 Val Gln Tyr Ser Val Lys Ile Glu Gln Asp Ile Glu Cys Gly Gly Ala
 100 105 110
 Tyr Ile Lys Leu Leu Ser Gly Tyr Val Asn Gln Lys Gln Phe Gly Gly
 115 120 125
 Asp Thr Pro Tyr Ser Leu Met Phe Gly Pro Asp Ile Cys Gly Thr Gln
 130 135 140
 Thr Lys Lys Leu His Val Ile Val Ser Tyr Gln Gly Gln Asn Tyr Pro
 145 150 155 160
 Ile Lys Lys Asp Leu
 165

<210> 22
 <211> 82
 <212> PRT
 <213> Nicotiana tabacum

<400> 22

Gly Val Trp Met Glu Pro Asp Tyr Ala Lys Thr Ser Asp Ser Arg Lys
 1 5 10 15
 Cys Leu Pro Ile Gly Glu Ala Glu Lys Glu Ala Phe Glu Glu Ala Glu
 20 25 30
 Lys Val Arg Lys Ala Lys Glu Glu Glu Glu Ala Gln Arg Ala Arg Glu
 35 40 45
 Glu Gly Glu Arg Arg Lys Arg Glu Arg Gly Arg Asp Arg His Arg Asp
 50 55 60
 Arg Tyr Lys Lys Arg Tyr His His Asp Tyr Met Asp Asp Tyr His Asp
 65 70 75 80
 Glu Leu

<210> 23

<211> 85

<212> PRT

<213> Arabidopsis thaliana

<400> 23

Ile Leu Ile Cys Asp Asp Pro Ala Tyr Ala Arg Ser Ile Val Asp Asp
 1 5 10 15
 Tyr Phe Ala Gln His Arg Glu Ser Glu Lys Glu Leu Phe Ala Glu Ala
 20 25 30
 Glu Lys Glu Arg Lys Ala Arg Glu Asp Glu Glu Ala Arg Ile Ala Arg
 35 40 45
 Glu Glu Gly Glu Arg Arg Arg Lys Glu Arg Asp His Arg Tyr Gly Asp
 50 55 60
 Arg Arg Arg Arg Tyr Lys Arg Pro Asn Pro Arg Asp Tyr Met Asp Asp
 65 70 75 80
 Tyr His Asp Glu Leu
 85

<210> 24

<211> 310

<212> PRT

<213> Arabidopsis thaliana

<400> 24

Met Asn Asp Leu Met Thr Lys Ser Phe Met Ser Tyr Val Asp Leu Lys
 1 5 10 15
 Lys Ala Ala Met Lys Asp Met Glu Ala Gly Pro Asp Phe Asp Leu Glu
 20 25 30

Met Ala Ser Thr Lys Ala Asp Lys Met Asp Glu Asn Leu Ser Ser Phe
 35 40 45
 Leu Glu Glu Ala Glu Tyr Val Lys Ala Glu Met Gly Leu Ile Ser Glu
 50 55 60
 Thr Leu Ala Arg Ile Glu Gln Tyr His Glu Glu Ser Lys Gly Val His
 65 70 75 80
 Lys Ala Glu Ser Val Lys Ser Leu Arg Asn Lys Ile Ser Asn Glu Ile
 85 90 95
 Val Ser Gly Leu Arg Lys Ala Lys Ser Ile Lys Ser Lys Leu Glu Glu
 100 105 110
 Met Asp Lys Ala Asn Lys Glu Ile Lys Arg Leu Ser Gly Thr Pro Val
 115 120 125
 Tyr Arg Ser Arg Thr Ala Val Thr Asn Gly Leu Arg Lys Lys Leu Lys
 130 135 140
 Glu Val Met Met Glu Phe Gln Gly Leu Arg Gln Lys Met Met Ser Glu
 145 150 155 160
 Tyr Lys Glu Thr Val Glu Arg Arg Tyr Phe Thr Val Thr Gly Glu His
 165 170 175
 Ala Asn Asp Glu Met Ile Glu Lys Ile Ile Thr Asp Asn Ala Gly Gly
 180 185 190
 Glu Glu Phe Leu Thr Arg Ala Ile Gln Glu His Gly Lys Gly Lys Val
 195 200 205
 Leu Glu Thr Val Val Glu Ile Gln Asp Arg Tyr Asp Ala Ala Lys Glu
 210 215 220
 Ile Glu Lys Ser Leu Leu Glu Leu His Gln Val Phe Leu Asp Met Ala
 225 230 235 240
 Val Met Val Glu Ser Gln Gly Glu Gln Met Asp Glu Ile Glu His His
 245 250 255
 Val Ile Asn Ala Ser His Tyr Val Ala Asp Gly Ala Asn Glu Leu Lys
 260 265 270
 Thr Ala Lys Ser His Gln Arg Asn Ser Arg Lys Trp Met Cys Ile Gly
 275 280 285
 Ile Ile Val Leu Leu Leu Ile Ile Leu Ile Val Val Ile Pro Ile Ile
 290 295 300
 Thr Ser Phe Ser Ser Ser
 305 310

<210> 25
 <211> 259
 <212> PRT
 <213> Homo sapiens

<400> 25

Met Asp Glu Phe Phe Glu Gln Val Glu Glu Ile Arg Gly Phe Ile Asp
 1 5 10 15
 Lys Ile Ala Glu Asn Val Glu Glu Val Lys Arg Lys His Ser Ala Ile
 20 25 30
 Leu Ala Ser Pro Asn Pro Asp Glu Lys Thr Lys Val Glu Leu Glu Glu
 35 40 45
 Leu Met Ser Asp Ile Lys Lys Thr Ala Asn Lys Val Arg Ser Lys Leu
 50 55 60
 Lys Ser Ile Glu Gln Ser Ile Glu Gln Glu Gly Leu Asn Arg Ser
 65 70 75 80
 Ser Ala Asp Leu Arg Ile Arg Lys Thr Gln His Ser Thr Leu Ser Arg
 85 90 95
 Lys Phe Val Glu Val Met Ser Glu Tyr Asn Ala Thr Gln Ser Val Tyr
 100 105 110
 Arg Glu Arg Cys Lys Gly Arg Ile Gln Arg Gln Leu Glu Ile Thr Gly
 115 120 125
 Arg Thr Thr Thr Ser Glu Glu Leu Glu Asp Met Leu Glu Ser Gly Asn
 130 135 140
 Pro Ala Ile Phe Ala Ser Gly Ile Ile Met Asp Ser Ser Ile Ser Lys
 145 150 155 160
 Gln Ala Leu Ser Glu Ile Glu Thr Arg His Ser Glu Ile Ile Lys Leu
 165 170 175
 Glu Asn Ser Ile Arg Glu Leu His Asp Met Phe Met Asp Met Ala Met
 180 185 190
 Leu Val Glu Ser Gln Gly Glu Met Ile Asp Arg Ile Glu Tyr Asn Val
 195 200 205
 Glu His Ala Val Asp Tyr Val Glu Arg Ala Val Ser Asp Thr Lys Lys
 210 215 220
 Ala Val Lys Tyr Gln Ser Lys Ala Arg Arg Lys Lys Ile Met Ile Ile
 225 230 235 240
 Ile Cys Cys Val Ile Leu Gly Ile Val Ile Ala Ser Thr Val Gly Gly
 245 250 255
 Ile Phe Ala

<210> 26

<211> 288

<212> PRT

<213> Homo sapiens

<400> 26

Met Lys Asp Arg Thr Gln Val Leu Arg Thr Arg Arg Asn Ser Asp Asp
 1 5 10 15
 Lys Glu Glu Val Val His Val Asp Arg Asp His Phe Met Asp Glu Phe
 20 25 30
 Phe Glu Gln Glu Glu Glu Ile Arg Gly Cys Ile Glu Lys Leu Ser Glu
 35 40 45
 Asp Val Glu Gln Val Lys Lys Gln His Ser Ala Ile Leu Ala Ala Pro
 50 55 60
 Asn Pro Asp Glu Arg Thr Lys Gln Glu Leu Glu Asp Leu Thr Ala Asp
 65 70 75 80
 Ile Lys Lys Thr Ala Asn Lys Val Arg Ser Lys Leu Lys Ala Ile Glu
 85 90 95
 Gln Ser Ile Glu Gln Glu Glu Gly Ser Thr Ala Pro Arg Pro Ile Leu
 100 105 110
 Arg Ile Arg Lys Thr Gln His Ser Thr Leu Ser Arg Lys Phe Val Glu
 115 120 125
 Val Met Thr Glu Tyr Asn Ala Thr Gln Ser Lys Tyr Arg Asp Arg Cys
 130 135 140
 Lys Asp Arg Ile Gln Arg Gln Leu Glu Ile Thr Gly Arg Thr Thr Thr
 145 150 155 160
 Asn Glu Glu Leu Glu Asp Met Leu Glu Ser Gly Lys Leu Pro Ile Phe
 165 170 175
 Thr Asp Asp Ile Lys Met Asp Ser Gln Met Thr Lys Gln Ala Leu Asn
 180 185 190
 Glu Ile Glu Thr Arg His Asn Glu Ile Ile Lys Leu Glu Thr Ser Ile
 195 200 205
 Arg Glu Leu His Asp Met Phe Val Asp Met Ala Met Leu Val Glu Ser
 210 215 220
 Gln Gly Glu Met Ile Asp Arg Ile Glu Tyr Asn Val Glu His Ser Val
 225 230 235 240
 Asp Tyr Val Glu Arg Ala Val Ser Asp Thr Lys Lys Ala Val Lys Tyr
 245 250 255
 Gln Ser Lys Ala Arg Arg Lys Lys Ile Ile Ile Ile Ile Cys Cys Val
 260 265 270
 Val Leu Gly Val Val Leu Ala Ser Ser Ile Gly Cys Thr Leu Gly Leu
 275 280 285

<210> 27
 <211> 291
 <212> PRT
 <213> Drosophila melanogaster

<400> 27

```

Met Thr Lys Asp Arg Leu Ala Ala Leu His Ala Ala Gln Ser Asp Asp
1          5          10          15

Glu Glu Glu Thr Glu Val Ala Val Asn Val Asp Gly His Asp Ser Tyr
20          25          30

Met Asp Asp Phe Phe Ala Gln Val Glu Glu Ile Arg Gly Met Ile Asp
35          40          45

Lys Val Gln Asp Asn Val Glu Glu Val Lys Lys Lys His Ser Ala Ile
50          55          60

Leu Ser Ala Pro Gln Thr Asp Glu Lys Thr Lys Gln Glu Leu Glu Asp
65          70          75          80

Leu Met Ala Asp Ile Lys Lys Asn Ala Asn Arg Val Arg Gly Lys Leu
85          90          95

Lys Gly Ile Glu Gln Asn Ile Glu Gln Glu Glu Gln Gln Asn Lys Ser
100         105         110

Ser Ala Asp Leu Arg Ile Arg Lys Thr Gln His Ser Thr Leu Ser Arg
115         120         125

Lys Phe Val Glu Val Met Thr Glu Tyr Asn Arg Thr Gln Thr Asp Tyr
130         135         140

Arg Glu Arg Cys Lys Gly Arg Ile Gln Arg Gln Leu Glu Ile Thr Gly
145         150         155         160

Arg Pro Thr Asn Asp Asp Glu Leu Glu Lys Met Leu Glu Glu Gly Asn
165         170         175

Ser Ser Val Phe Thr Gln Gly Ile Ile Met Glu Thr Gln Gln Ala Lys
180         185         190

Gln Thr Leu Ala Asp Ile Glu Ala Arg His Gln Asp Ile Met Lys Leu
195         200         205

Glu Thr Ser Ile Lys Glu Leu His Asp Met Phe Met Asp Met Ala Met
210         215         220

Leu Val Glu Ser Gln Gly Glu Met Ile Asp Arg Ile Glu Tyr His Val
225         230         235         240

Glu His Ala Met Asp Tyr Val Gln Thr Ala Thr Gln Asp Thr Lys Lys
245         250         255

Ala Leu Lys Tyr Gln Ser Lys Ala Arg Arg Lys Lys Ile Met Ile Leu
260         265         270

Ile Cys Leu Thr Val Leu Gly Ile Leu Ala Ala Ser Tyr Val Ser Ser
275         280         285

Tyr Phe Met
290

```

<210> 28
<211> 6
<212> PRT
<213> Nicotiana tabacum

<400> 28

Leu Gln Val Ala Arg Lys
1 5

<210> 29
<211> 6
<212> PRT
<213> Drosophila melanogaster

<400> 29

Thr Lys Lys Ala Leu Lys
1 5

<210> 30
<211> 6
<212> PRT
<213> Rattus sp.

<400> 30

Thr Lys Lys Ala Val Lys
1 5

<210> 31
<211> 6
<212> PRT
<213> yeast sp.

<400> 31

Thr Asp Lys Ala Val Lys
1 5

<210> 32
<211> 6
<212> PRT
<213> yeast sp.

<400> 32

Thr Asn Lys Ala Val Lys
1 5

<210> 33
<211> 13
<212> PRT
<213> Nicotiana tabacum

<400> 33

Asp Gln Ser Asp Ser His Ala Ile Glu Met Gly Asp Ile

```

1              5              10

<210> 34
<211> 5
<212> PRT
<213> Nicotiana tabacum

<400> 34

Gly Cys Gly Pro Gly
1              5

<210> 35
<211> 25
<212> PRT
<213> Nicotiana tabacum

<400> 35

Leu Glu Arg Asn Leu Lys Glu Leu His Gln Val Phe Leu Asp Met Ala
1              5              10              15

Val Leu Val Glu Ser Gln Gly Ala Gln
              20              25

<210> 36
<211> 25
<212> PRT
<213> Arabidopsis thaliana

<400> 36

Ile Glu Lys Ser Leu Leu Glu Leu His Gln Val Phe Leu Asp Met Ala
1              5              10              15

Val Met Val Glu Ser Gln Gly Glu Gln
              20              25

<210> 37
<211> 25
<212> PRT
<213> Homo sapiens

<400> 37

Leu Glu Asn Ser Ile Arg Glu Leu His Asp Met Phe Met Asp Met Ala
1              5              10              15

Met Leu Val Glu Ser Gln Gly Glu Met
              20              25

<210> 38
<211> 20
<212> PRT
<213> Nicotiana tabacum

<400> 38

Ile Ile Leu Leu Leu Ile Ile Ile Leu Val Val Val Leu Ser Ile Gln

```

1 5 10 15

Pro Trp Lys Lys
20

<210> 39
<211> 22
<212> PRT
<213> Arabidopsis thaliana

<400> 39

Ile Ile Val Leu Leu Leu Ile Ile Leu Ile Val Val Ile Pro Ile Ile
1 5 10 15

Thr Ser Phe Ser Ser Ser
20

<210> 40
<211> 21
<212> PRT
<213> Homo sapiens

<400> 40

Ile Ile Ile Cys Cys Val Ile Leu Gly Ile Val Ile Ala Ser Thr Val
1 5 10 15

Gly Gly Ile Phe Ala
20

<210> 41
<211> 20
<212> DNA
<213> Artificial sequence

<220>
<221> misc_feature
<222> (1)..(20)
<223> primer

<400> 41
taatacgact cactataggg

20

<210> 42
<211> 17
<212> DNA
<213> Artificial sequence

<220>
<221> misc_feature
<222> (1)..(17)
<223> primer

<400> 42
gtaaaacgac ggccagt

17

<210> 43
 <211> 19
 <212> DNA
 <213> Artificial sequence

<220>
 <221> misc_feature
 <222> (1)..(19)
 <223> primer

<400> 43
 ggaaacagct atgaccatg

19

<210> 44
 <211> 13
 <212> PRT
 <213> keyhole limpet haemocyanin

<400> 44

Cys Gly Pro Gly Ser Ser Ser Asp Arg Thr Arg Thr Ser
 1 5 10